

=====

Sequence Listing was accepted.

If you need help call the Patent Electronic Business Center at (866)
217-9197 (toll free).

Reviewer: MSpencer

Timestamp: Thu Apr 26 13:51:51 EDT 2007

=====

Application No: 10584429 Version No: 4.0

Input Set: E:\2007\04\13\10584429\JAMES.TXT

Output Set: E:\2007\04\13\10584429\JAMES.pdf

Started: 2007-04-19 14:28:04.599
Finished: 2007-04-19 14:28:05.671
Elapsed: 0 hr(s) 0 min(s) 1 sec(s) 72 ms
Total Warnings: 0
Total Errors: 0
No. of SeqIDs Defined: 55
Actual SeqID Count: 55

ErrCode	Error Description
----------------	--------------------------

SEQUENCE LISTING

<110> Bryan, Gregory Thomas
Johnson, Richard
Scott, Barry
Young, Carolyn A.
Tapper, Brian Anthony
Parker, Emily Jane

<120> INDOLE-DITERPENE BIOSYNTHESIS

<130> JAMES68.016APC

<140> 10584429

<141> 2007-05-07

<150> US 10/584,429

<151> 2006-06-22

<150> PCT/NZ2004/000333

<151> 2004-12-22

<150> NZ 530331

<151> 2003-12-22

<160> 55

<170> PatentIn version 3.3

<210> 1

<211> 1110

<212> DNA

<213> Neotyphodium lolii

<400> 1

atgacgatgg ctgccaatga ctttccattt caatgccagg agaagaaaatc atattctcag 60

ccaagtctag tctactgcaa tggtaacatt gcggagacgt atctcgaaga aaaggatttt 120

atactgctcc tttataatct cgaatgccac ttaaaattta gacaggttt gacagcgccg 180

ttggattatt tgcgtgcctt acctagcaaa gatattcgca gtggactgac cgacgcccatt 240

aatgagttcc tgcgtgtccc agagggaaaag gttcttgtca taaagcgtat aattgatctt 300

cttcacaatg catccttaact gtaagttcga gattgcataa catagaccta gtagattcta 360

actaacagct ttagcattga tggatccatcg gattcatcca aactgcgacg tggagtccct 420

gtagcccacc acatatttg aatcgacaaa acaataaatt cggccatct agcgtatttc 480

attgcccaga gagagcttga gaagcttacg aatcctcgag catttgctat atataatgag 540

gagctaatacg atctgcatacg tggtcagggt atggagctcc attggagaga atcgctccat 600

tgccttaccc aagatgagta tctgcgaatg atccaaaaga agacaggcgg tctggtccga 660

ttggcaatca gactgctgca aggcgaaagc gctagcgatg acgattatgt ctcacttatt	720
gatactctcg gaacctgtt ccagattcga gatgactatc aaaacttaca gagtgatata	780
tattctaaga acaaaggcta ctgtgaggat ttaacagagg gcaaattctc gtatccggtc	840
atccatagta ttcggtcgcg accaggagat gttcgattaa tcaatatttt gaaacagcgt	900
agtgaagatg ttatggtaaa gcaatacgcg gtgcaacata tcgaatctac aggaagctc	960
gcattctgtc aaaataaaat tcaatcttg gtggagcaag caagagagca attggcggct	1020
ctagaaaata gcagttcatg tggaggcccc gttcgcgaca tccttgacaa gttagcaata	1080
aaaccacggg caaatataga agtagagtag	1110

<210> 2
 <211> 334
 <212> PRT
 <213> *Neotyphodium lolii*

<400> 2

Met Thr Met Ala Ala Asn Asp Phe Pro Phe Gln Cys Gln Glu Lys Lys			
1	5	10	15

Ser Tyr Ser Gln Pro Ser Leu Val Tyr Cys Asn Gly Asn Ile Ala Glu		
20	25	30

Thr Tyr Leu Glu Glu Lys Val Leu Thr Ala Pro Leu Asp Tyr Leu Arg		
35	40	45

Ala Leu Pro Ser Lys Asp Ile Arg Ser Gly Leu Thr Asp Ala Ile Asn		
50	55	60

Glu Phe Leu Arg Val Pro Glu Glu Lys Val Leu Val Ile Lys Arg Ile			
65	70	75	80

Ile Asp Leu Leu His Asn Ala Ser Leu Leu Ile Asp Asp Ile Gln Asp		
85	90	95

Ser Ser Lys Leu Arg Arg Gly Val Pro Val Ala His His Ile Phe Gly		
100	105	110

Ile Ala Gln Thr Ile Asn Ser Ala Asn Leu Ala Tyr Phe Ile Ala Gln		
115	120	125

Arg Glu Leu Glu Lys Leu Thr Asn Pro Arg Ala Phe Ala Ile Tyr Asn
130 135 140

Glu Glu Leu Ile Asn Leu His Arg Gly Gln Gly Met Glu Leu His Trp
145 150 155 160

Arg Glu Ser Leu His Cys Pro Thr Glu Asp Glu Tyr Leu Arg Met Ile
165 170 175

Gln Lys Lys Thr Gly Gly Leu Phe Arg Leu Ala Ile Arg Leu Leu Gln
180 185 190

Gly Glu Ser Ala Ser Asp Asp Asp Tyr Val Ser Leu Ile Asp Thr Leu
195 200 205

Gly Thr Leu Phe Gln Ile Arg Asp Asp Tyr Gln Asn Leu Gln Ser Asp
210 215 220

Ile Tyr Ser Lys Asn Lys Gly Tyr Cys Glu Asp Leu Thr Glu Gly Lys
225 230 235 240

Phe Ser Tyr Pro Val Ile His Ser Ile Arg Ser Arg Pro Gly Asp Val
245 250 255

Arg Leu Ile Asn Ile Leu Lys Gln Arg Ser Glu Asp Val Met Val Lys
260 265 270

Gln Tyr Ala Val Gln His Ile Glu Ser Thr Gly Ser Phe Ala Phe Cys
275 280 285

Gln Asn Lys Ile Gln Ser Leu Val Glu Gln Ala Arg Glu Gln Leu Ala
290 295 300

Ala Leu Glu Asn Ser Ser Ser Cys Gly Gly Pro Val Arg Asp Ile Leu
305 310 315 320

Asp Lys Leu Ala Ile Lys Pro Arg Ala Asn Ile Glu Val Glu
325 330

<210> 3

<211> 1647

<212> DNA

<213> Neotyphodium lolii

<400> 3
atgactagcg acttcaaggt aataatcgtg ggaggatcg tggctggct ttcactagcc 60
cactgcttag aaaaaatcggtgtttt atggttcttag agaagggtaa tcaaatacg 120
ccccaaactcg gtgcctcaat tggcattttg ccaaattgtg gacgtattct tgcataactg 180
ggcatcttcc atagcatcga ggatgaaatc gaacctctag aatctgctat gatgagatac 240
ccggatggtt tctcttcaa aagtcaatat cccaaagctt tgcataactg gtaataacag 300
tgaaagaaga gtggcctata agtgttcata tatcgctaac ttctgtcggt taatagttt 360
ggttatcccc tggcttcct tgagaggcaa aggtttttc agatacttta tgataaaactc 420
aagagcaaag actgcgtttt tacaacaacaaag cgggttagtca gtattgcaag tggccaagac 480
aaagtccacag caaagacttc agatggcgct aagtacttag cagatatcgt gatcggtgct 540
gacggggtcc acagcatcgt caggtcagag atttggaggc atttgaagga aaactctcaa 600
atatcagtat tagaggcacc gaacgcaagt aggttaacct aggattaatt gcaaagaaac 660
tttactaatg agggagccac ttaggttata agcatgatta ttcatgcatt tacgaaattt 720
ctttaaacgt tccccagatc atccttagaa tacagttaaa ctgttttagat gacggagtgt 780
caatacactt gtttacgggt aaacaatcca aattatttt gtttgcattc atcaaaacgc 840
ctcaggctag ctttgctaaa gtagagattt acaatacaca tacagcaagg tgtatctgcg 900
aaggactgag gacgaaaaag gtttcagata cttatgttt tgaagatgta tggtaagat 960
gcaccatatt caagatgacg cctcttgagg aaggggtgtt taagcattgg aactatggcc 1020
gcttagcatg tattgggtat gctatccgca aggtatgtgg atgatgctat atgtccctat 1080
ttcgtgtcat cagtggtatg acaaaaagaag gccactatcc gccgctaata taaatgatcg 1140
tatcgctaac attaacagat ggccccaaat aatgggcaag gagcaaatat ggcgatagag 1200
gacgcttgca gtctcgcaaa catcctccag aaaaagatat cacatggtc gattcgagac 1260
caagatatca attcaatgtt tcaggaattt tctatggctc aacgggctcg cacggagac 1320
gtctgcgcgc agtcggagtt tctagtcgc atgcatacgat atcaaggat tggaaagaaga 1380
cttcttgggc ggtaccttat tccttcctt tatgacgcac ctgctggttt atctggattt 1440
tctataagtgcgcgcaacaag aatagagttc atagacttgc ccactagatc tcttagggaa 1500
gcgtggggaa agtcatggag agggtcattt gatttcattt tacaagctt ggtctattt 1560
cgacccaagt ttaggatagt ttatgcctt tatctcgat cagctgcagc ttttatctt 1620
tattgtctta gcagtcctt cccgtat 1647

<210> 4
<211> 472
<212> PRT
<213> *Neotyphodium lolii*

<400> 4

Met Thr Ser Asp Phe Lys Val Ile Ile Val Gly Gly Ser Val Ala Gly
1 5 10 15

Leu Ser Leu Ala His Cys Leu Glu Lys Ile Gly Val Ser Phe Met Val
20 25 30

Leu Glu Lys Gly Asn Gln Ile Ala Pro Gln Leu Gly Ala Ser Ile Gly
35 40 45

Ile Leu Pro Asn Gly Gly Arg Ile Leu Asp Gln Leu Gly Ile Phe His
50 55 60

Ser Ile Glu Asp Glu Ile Glu Pro Leu Glu Ser Ala Met Met Arg Tyr
65 70 75 80

Pro Asp Gly Phe Ser Phe Lys Ser Gln Tyr Pro Gln Ala Leu His Thr
85 90 95

Ser Phe Gly Tyr Pro Val Ala Phe Leu Glu Arg Gln Arg Phe Leu Gln
100 105 110

Ile Leu Tyr Asp Lys Leu Lys Ser Lys Asp Cys Val Phe Thr Asn Lys
115 120 125

Arg Val Val Ser Ile Ala Ser Gly Gln Asp Lys Val Thr Ala Lys Thr
130 135 140

Ser Asp Gly Ala Lys Tyr Leu Ala Asp Ile Val Ile Gly Ala Asp Gly
145 150 155 160

Val His Ser Ile Val Arg Ser Glu Ile Trp Arg His Leu Lys Glu Asn
165 170 175

Ser Gln Ile Ser Val Leu Glu Ala Pro Asn Ala Ser Ile Lys His Asp
180 185 190

Tyr Ser Cys Ile Tyr Gly Ile Ser Leu Asn Val Pro Gln Ile Ile Leu

195

200

205

Gly Ile Gln Leu Asn Cys Leu Asp Asp Gly Val Ser Ile His Leu Phe
210 215 220

Thr Gly Lys Gln Ser Lys Leu Phe Trp Phe Val Ile Ile Lys Thr Pro
225 230 235 240

Gln Ala Ser Phe Ala Lys Val Glu Ile Asp Asn Thr His Thr Ala Arg
245 250 255

Cys Ile Cys Glu Gly Leu Arg Thr Lys Lys Val Ser Asp Thr Leu Cys
260 265 270

Phe Glu Asp Val Trp Ser Arg Cys Thr Ile Phe Lys Met Thr Pro Leu
275 280 285

Glu Glu Gly Val Phe Lys His Trp Asn Tyr Gly Arg Leu Ala Cys Ile
290 295 300

Gly Asp Ala Ile Arg Lys Met Ala Pro Asn Asn Gly Gln Gly Ala Asn
305 310 315 320

Met Ala Ile Glu Asp Ala Cys Ser Leu Ala Asn Ile Leu Gln Lys Lys
325 330 335

Ile Ser His Gly Ser Ile Arg Asp Gln Asp Ile Asn Ser Met Phe Gln
340 345 350

Glu Phe Ser Met Ala Gln Arg Ala Arg Thr Glu Ser Val Cys Ala Gln
355 360 365

Ser Glu Phe Leu Val Arg Met His Ala Asn Gln Gly Ile Gly Arg Arg
370 375 380

Leu Leu Gly Arg Tyr Leu Ile Pro Phe Leu Tyr Asp Ala Pro Ala Gly
385 390 395 400

Leu Ser Gly Phe Ser Ile Ser Gly Ala Thr Arg Ile Glu Phe Ile Asp
405 410 415

Leu Pro Thr Arg Ser Leu Arg Gly Ala Trp Gly Lys Ser Trp Arg Gly
420 425 430

Ser Trp Glu Phe Ile Leu Gln Ser Leu Val Tyr Leu Arg Pro Lys Phe
435 440 445

Arg Ile Val Tyr Ala Leu Tyr Leu Val Ala Ala Ala Ala Ala Phe Ile Leu
450 455 460

Tyr Cys Leu Ser Ser Leu Phe Pro
465 470

<210> 5
<211> 2063
<212> DNA
<213> *Neotyphodium lolii*

aaagttaaca	gtttgatta	tatcaaatcc	aatgacttgc	tgcaaggagt	tatggaaatg	1200
tcttctccta	gtcatgagga	tagccagctt	gatgttgtcg	cccagataat	gctcacatgt	1260
aacacaatcg	ctggccacag	tactgccgca	tccggagcac	atgcactgtt	cgatatggtt	1320
agccactcta	agtatattga	attgctgcgt	gaggaggctc	ttcaagtctt	tcgacatgtt	1380
gaactgcgtg	ttacaaaaca	ggctttgggg	gatttgcgaa	aattggacag	cttcctcaga	1440
gagtttagtat	tgtcctaaac	atcacaatct	caccacattc	tcacgcttagc	ttttcctccg	1500
tactaatgat	ggtcgttgct	aagatcccaa	cgacataatc	cgctaagctt	gtgtatgttt	1560
agctaagagt	ctcgaaaacc	tggaaatgtt	tgtcctgtgc	ccgagttcta	acgtctctta	1620
ctacagtagg	ctttttcgg	gtcgtttag	accctgccgg	tatcacactt	caagatggca	1680
cacatgttcc	ttacaacaca	ctgcttgtg	tcgcaccaca	tgcgatatcc	aatgaccgg	1740
atgtgataga	agacccaacc	tcgttcaacg	gtctgcgata	ctacgaacag	cgctgtcgtg	1800
acgccagtca	agagaaaaag	catcaatacg	ctactacgga	taaatctcac	ctgcatttg	1860
gctacggaac	ctgggcctgt	ccaggccgct	tcttggcctc	tgatatgtta	aaagtgattc	1920
taacgatgct	tctgcttcag	tatgacatcc	gctccccga	gagagcaaaa	cggcctgtgg	1980
caggtcattt	tcatgagttt	ccgctttca	atattaacac	accactgtta	atgaaacgac	2040
gcaatgattc	gctagttcta	tga				2063

<210> 6
 <211> 533
 <212> PRT
 <213> *Neotyphodium lolii*

<400> 6

Met	Gln	Tyr	Gly	Asn	Leu	Thr	Thr	Val	Leu	Leu	Leu	Arg	Asn	Thr	Leu	
1					5				10				15			

Leu	Ser	Leu	Asn	Ser	Ser	Ile	Cys	His	Val	His	Trp	Leu	Gln	Val	
						20			25			30			

Ile	Val	Ala	Leu	Leu	Val	Leu	Ile	Val	Cys	Ile	Phe	Leu	Tyr	Trp	Arg
							35		40			45			

Thr	Pro	Thr	Gly	Ile	Asn	Ala	Pro	Phe	Ala	Gly	Tyr	Arg	Ser	Pro	Trp
						50			55			60			

Glu Pro Pro Leu Leu Val Gln Met Arg Tyr Val Phe Asn Ala Ala Ser
65 70 75 80

Met Ile Arg Glu Gly Tyr Ala Lys Trp Lys Asp Ser Leu Phe Gln Ile
85 90 95

Ser Arg Tyr Asp Gly Asp Ile Leu Ile Val Pro Pro Arg Tyr Leu Asp
100 105 110

Asp Leu His Asn Lys Ser Gln Glu Glu Leu Ser Ala Ile Tyr Gly Leu
115 120 125

Ile Arg Asn Phe Gly Gly Ser Tyr Ser Gly Ile Thr Leu Leu Gly Glu
130 135 140

Asn Asp Val Gly Ile Arg Ala Leu Gln Thr Lys Ile Thr Pro Asn Leu
145 150 155 160

Ala Lys Leu Cys Asp Asp Ile Arg Asp Glu Phe Gln Tyr Cys Leu Asp
165 170 175

Thr Asp Phe Pro Ala Cys Arg Asp Trp Thr Ser Val Ser Val His Pro
180 185 190

Leu Phe Leu Lys Ala Val Glu Arg Ile Thr His Arg Ile Phe Val Gly
195 200 205

Leu Pro Leu Cys Arg Asn Pro Gln Trp Val Gln Ala Thr Ser Lys His
210 215 220

Ala His Tyr Ala Thr Met Ile Gln Ile Ala Met Arg Ser Val Pro Lys
225 230 235 240

Phe Ile Gln Pro Leu Leu Asn Phe Cys Leu Pro Trp Pro Trp Lys Asn
245 250 255

Ala Ala Cys Val Arg Glu Ala Lys Asn Ala Leu Ile Leu Glu Met Gln
260 265 270

Arg Arg Arg Asn Leu Glu Lys Val Asn Ser Phe Asp Tyr Ile Lys Ser
275 280 285

Asn Asp Leu Leu Gln Ala Val Met Glu Met Ser Ser Pro Ser His Glu

290

295

300

Asp Ser Gln Leu Asp Val Val Ala Gln Ile Met Leu Thr Met Asn Thr
305 310 315 320

Ile Ala Gly His Ser Thr Ala Ala Ser Gly Ala His Ala Leu Phe Asp
325 330 335

Met Val Ser His Ser Lys Tyr Ile Glu Leu Leu Arg Glu Glu Ala Leu
340 345 350

Gln Val Phe Arg His Val Glu Leu Arg Val Thr Lys Gln Ala Leu Gly
355 360 365

Asp Leu Arg Lys Leu Asp Ser Phe Leu Arg Glu Ser Gln Arg His Asn
370 375 380

Pro Leu Ser Leu Leu Gly Phe Phe Arg Val Val Leu Asp Pro Ala Gly
385 390 395 400

Ile Thr Leu Gln Asp Gly Thr His Val Pro Tyr Asn Thr Leu Leu Cys
405 410 415

Val Ala Pro His Ala Ile Ser Asn Asp Pro Asp Val Ile Glu Asp Pro
420 425 430

Thr Ser Phe Asn Gly Leu Arg Tyr Tyr Glu Gln Arg Cys Arg Asp Ala
435 440 445

Ser Gln Glu Lys Lys His Gln Tyr Ala Thr Thr Asp Lys S